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NOTES FOR STUDENTS

Vegetation of British Guiana.—HITCHCOCK³ has given an interesting sketch of the conditions of plant life in British Guiana, with notes on the flora. The climate shows great uniformity of temperature, the mean maximum having the narrow variation of 83° to 87° F., and the mean minimum from 74.5° to 76.5° F. The annual rainfall ranges from 150 inches in the north to 50 inches in the south, with a relatively dry period extending from August to November. Virgin forest covers the greater part of the country, showing many of the characteristics of tropical rain forest, such as stratification, abundance of lianas, buttressed trunks for the larger trees, and great luxuriance. Attention is directed to cleanness of the forest floor due to the destruction of fallen trees and branches by decay and by wood ants. This condition is also accentuated by the scanty growth of low vegetation due to the density and uniformity of the shade. Species of the forest trees are not gregarious, but are scattered here and there.

The flora shows some interesting comparisons with that of the United States. Grasses, sedges, and leguminous plants are about equally abundant in the two regions. Some families common in the United States have here few species, as Fagaceae, Cruciferae, Ranunculaceae, Rosaceae, Labiatae, Umbelliferae, and Compositae. Some familiar families are found in Guiana chiefly as trees, as Euphorbiaceae and Solanaceae. On the other hand, certain families sparsely represented in the United States are found in greatly increased numbers. Notable among these are the Araceae, Palmaceae, Piperaceae, Rubiaceae, Myrtaceae, Lauraceae, Sapotaceae, and Melastomaceae. Orchids reach their highest development on the mountains.—GEO. D. FULLER.

Soil moisture.—As a result of recent investigations, PARKER⁴ presents evidence that the vapor pressure of different moisture contents, the equilibrium relations with seeds, and the freezing point depression due to solid material do not indicate different forms of soil water such as given by the dilatometer method. This would indicate that the old method of classifying soil moisture as hygroscopic, capillary, and gravitational, although open to certain objections, still remains the best available. The opposing view, presented by BOUYOUCOS, has already been noted in this journal.⁵ PARKER's experiments, however, tend to support the views of such modern authorities as RUSSELL and KEEN that all the water present in the soil is subjected to the same law over the whole experimental range, and the various constant and critical points shown by soils at varying degrees of water content are equilibrium values only, and do not indicate any break or abrupt change in the physical condition of the soil moisture.

³ HITCHCOCK, A. S., Floral aspects of British Guiana. Ann. Rept. Smithsonian Inst. for 1919. pp. 293-305. *pls.* 12. 1921.

⁴ PARKER, F. W., The classification of soil moisture. Soil Science 13:43-54. 1922.

⁵ BOT. GAZ. 73:420. 1922.

In this and in a previous paper,⁶ PARKER holds that the freezing point depression for the moisture equivalent and probably also for the wilting coefficient is practically a constant for all soils. This may be taken as additional evidence that the moisture equivalent and wilting coefficient are within very considerable limits constants for all soils.—GEO. D. FULLER.

Physicochemical problems relating to soil.—Under this title⁷ the Faraday Society has brought together in book form the papers presented before the Society during the general discussion of this topic at its meeting in London on May 31, 1921. The discussion is divided into five sections, and was planned to form a rather complete survey of the subject. The first section is general in nature, and consists of a survey of the whole field by RUSSELL, and a discussion of the physical properties of soils in relation to survey work by ROBINSON. The second section deals with the problems of soil moisture, with papers by KEEN, ODÉN, HOAGLAND, SHULL, and HACKETT. The third section considers the organic constituents of the soil, with papers by PAGE, ODÉN, and SALISBURY. The last two sections are concerned with colloidal properties, the adsorption phenomena of section four being discussed by FISCHER, CROWTHER, and MORRISON. The final section deals with the dispersity, flocculation, and plasticity of clays by ODÉN, COMBER, and MELLOR.

The discussion as a whole forms an important addition to soil literature, and one is impressed by the usefulness of such symposia as the Faraday Society has organized from time to time. The custom of holding such general discussions devoted to an entire survey of some field of investigation is one that might well be established among scientific societies in this country to replace the less valuable type of symposium now in vogue here.—C. A. SHULL.

Photosynthesis control in forest plants.—In investigating the conditions affecting photosynthesis in forest undergrowth, LUNDEGÅRDH,⁸ using a new form of assimilation-chamber, found that with variations of carbon dioxide concentration and low light intensities both the light and the carbon dioxide supply are controlling factors. The advantages from a supply of carbon dioxide above normal appear most strongly in low intensities of light. For *Oxalis acetosella* at 0.025 of sunlight, and for *Viola tricolor* at 0.25, an approximately direct proportionality was obtained between the carbon dioxide concentration and the intensity of photosynthesis. In the forest, on account of the production of the CO₂ by the ground, the air (especially that nearest the ground) becomes rich, the CO₂ content often rising to more than twice normal. This increase, least over sandy soil and greatest over the humus of beech woods,

⁶ PARKER, F. W., Methods of studying the concentration and composition of the soil solution. *Soil Science* 12:209-232. 1921.

⁷ Physicochemical problems relating to the soil. *Trans. Faraday Soc.* 17:217-368. 1922.

⁸ LUNDEGÅRDH, HENDRIK, Ecological studies in the assimilation of certain forest plants and shore plants. *Svensk. Bot. Tidsk.* 15:46-95. *figs. 9.* 1921.